

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1-11. (canceled)

12. (previously presented) A modulator-integrated light source in which a semiconductor laser and an electroabsorption optical modulator are integrated on a high-resistance semiconductor substrate;

wherein said electroabsorption optical modulator has a pair of electrodes arranged on one surface of said high-resistance semiconductor substrate and a prescribed bias voltage is applied to said electrodes;

said electroabsorption optical modulator is of a configuration that satisfies a condition:

$$L \times B \geq 2000 \mu\text{m} \cdot \text{Gb/s}$$

where L is a length of said electroabsorption optical modulator and B is an operating frequency;

an absorption peak wavelength of said electroabsorption optical modulator being shorter than an oscillation wavelength of said semiconductor laser; and

the energy conversion value ΔX of a detuning amount, which is the difference between said oscillation wavelength and

said absorption peak wavelength at room temperature, satisfies a condition:

$$40 \text{ meV} \leq \Delta\lambda \leq 100 \text{ meV}.$$

13. (previously presented) A modulator-integrated light source according to claim 12, wherein said prescribed bias voltage applied at a minimum operating temperature is 1 V or less.

14. (previously presented) A modulator-integrated light source according to claim 12, wherein said pair of electrodes are a P-type electrode and an N-type electrode, and said P-type electrode is a traveling-wave electrode.

15. (previously presented) A modulator-integrated light source according to claim 14, wherein an active layer of said electroabsorption optical modulator has an undoped layer and a thickness of said undoped layer gradually decreases with progression in a direction of progression of oscillation light from said semiconductor laser.

16. (previously presented) A modulator-integrated light source according to claim 12, wherein active layers of said semiconductor laser and said electroabsorption optical modulator are composed of layers buried by a semiconductor or a dielectric.

17. (previously presented) A modulator-integrated light source according to claim 16, wherein said buried layers are undoped layers.

18. (previously presented) A modulator-integrated light source according to claim 12, wherein quantum wells of an active layer of said semiconductor laser and quantum wells of an active layer of said electroabsorption optical modulator are joined by a butt joint.

19. (previously presented) A modulator-integrated light source according to claim 18, wherein the quantum wells of said electroabsorption optical modulator are of a structure wherein an energy level of a conductive band of wells is higher than an energy level of a conductive band of the barriers, and moreover, an energy level of a valence band of the wells is higher than an energy level of a valence band of the barriers.

20. (previously presented) A modulator-integrated light source according to claim 12, wherein aluminum is contained in a composition of the active layer of said electroabsorption optical modulator.

21. (canceled)